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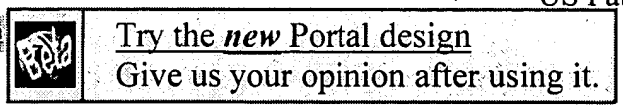
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↑ INDEX TERMS

Primary Classification:

C. Computer Systems Organization
↳ **C.2** COMPUTER-COMMUNICATION NETWORKS
↳ **C.2.2** Network Protocols
↳ **Subjects:** Protocol architecture (OSI model)

Additional Classification:

C. Computer Systems Organization
↳ **C.2** COMPUTER-COMMUNICATION NETWORKS
↳ **C.2.4** Distributed Systems
↳ **Subjects:** Distributed applications; Network operating systems

D. Software
↳ **D.4** OPERATING SYSTEMS
↳ **D.4.4** Communications Management

↳ **Subjects:** Network communication; Message sending
↳ **D.4.7** Organization and Design
↳ **Subjects:** Distributed systems

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1 Implementing remote procedure calls 92%
Andrew D. Birrell , Bruce Jay Nelson
ACM Transactions on Computer Systems (TOCS) February 1984
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2 Experience with Grapevine: the growth of a distributed system 91%
Michael D. Schroeder , Andrew D. Birrell , Roger M. Needham
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Volume 2 Issue 1

3 Secure communication using remote procedure calls 89%
Andrew D. Birrell
ACM Transactions on Computer Systems (TOCS) February 1985
Volume 3 Issue 1
Research on encryption-based secure communication protocols has reached a stage where it is feasible to construct end-to-end secure protocols. The design of such a protocol, built as part of a remote procedure call package, is described. The security abstraction presented to users of the package, the authentication mechanisms, and the protocol for encrypting and verifying remote calls are also described.

4 Implementing Remote procedure calls 82%
Andrew D. Birrell , Bruce Jay Nelson
ACM SIGOPS Operating Systems Review , Proceedings of the ninth ACM symposium on Operating systems principles October 1983
Volume 17 Issue 5
Remote procedure calls (RPC) are a useful paradigm for providing communication across a

network between programs written in a high level language. This paper describes a package, written as part of the Cedar project, providing a remote procedure call facility. The paper describes the options that face a designer of such a package, and the decisions we made. We describe the overall structure of our RPC mechanism, our facilities for binding RPC clients, the t ...

5 Grapevine: an exercise in distributed computing 82%

Andrew D. Birrell , Roy Levin , Michael D. Schroeder , Roger M. Needham

Communications of the ACM April 1982

Volume 25 Issue 4

Grapevine is a multicomputer system on the Xerox research internet. It provides facilities for the delivery of digital messages such as computer mail; for naming people, machines, and services; for authenticating people and machines; and for locating services on the internet. This paper has two goals: to describe the system itself and to serve as a case study of a real application of distributed computing. Part I describes the set of services provided by Grapevine and how its data and funct ...

6 Separating key management from file system security 82%

David Mazières , Michael Kaminsky , M. Frans Kaashoek , Emmett Witchel

ACM SIGOPS Operating Systems Review , Proceedings of the seventeenth ACM symposium on Operating systems principles December 1999

Volume 33 Issue 5

No secure network file system has ever grown to span the Internet. Existing systems all lack adequate key management for security at a global scale. Given the diversity of the Internet, any particular mechanism a file system employs to manage keys will fail to support many types of use.We propose separating key management from file system security, letting the world share a single global file system no matter how individuals manage keys. We present SFS, a secure file system that avoids internal ...

7 Removing backing store administration from the CAP operating system 80%

Carl Dellar

ACM SIGOPS Operating Systems Review October 1980

Volume 14 Issue 4

8 Experience with Grapevine (Summary): the growth of a distributed system 80%

Michael D. Schroeder , Andrew D. Birrell , Roger M. Needham

ACM SIGOPS Operating Systems Review , Proceedings of the ninth ACM symposium on Operating systems principles October 1983

Volume 17 Issue 5

Grapevine is a distributed, replicated system that provides message delivery, naming, authentication, resource location, and access control services in an internet of computers. The system, described in a previous paper [1], was designed and implemented several years ago. We now have had operational experience with the system under substantial load. This experience has proved the original design sound in most aspects, but there also have been some surprises. In this paper we report what we ...

9 Grapevine: An exercise in distributed computing 80%

Andrew D. Birrell , Roy Levin , Roger M. Needham , Michael D. Schroeder
Proceedings of the eighth symposium on Operating systems principles December 1981
Grapevine is a distributed, replicated system running on a large internet within the Xerox research and development community. The internet extends from coast to coast in the USA, to Canada and to Europe, and contains more than 50 Ethernet local networks linked by leased telephone lines. Over 1500 computers are attached to the internet. Most computers are used an personal workstations, but some are used as servers providing access to shared facilities such as printers, larg ...

10 The CAP project - an interim evaluation 80%
R. M. Needham
Proceedings of the sixth symposium on Operating systems principles November 1977
The CAP project has included the design and construction of a computer with an unusual and very detailed structure of memory protection, and subsequently the development of an operating system which fully exploits the protection facilities. The present paper passes the work in review and draws conclusions about good and bad aspects of the system. The basic architecture of the CAP machine is described in [1] and a largely prospective description of the protection system is given in [2].

11 The CAP filing system 80%
R. M. Needham , A. D. Birrell
Proceedings of the sixth symposium on Operating systems principles November 1977
The filing system for the CAP is based on the idea of preservation of capabilities: if a program has been able to obtain some capability then it has an absolute right to preserve it for subsequent use. The pursuit of this principle, using capability-oriented mechanisms in preference to access control lists, has led to a filing system in which a preserved capability may be retrieved from different directories to achieve different access statuses, in which the significance of a text name depe ...

12 Remote operation calls in a heterogeneous environment 80%
T. Patrick Martin , David T. Barnard , Ian A. Macleod , Brent Nordin , R. Mark Fleming
Proceedings of the 1988 ACM SIGSMALL/PC symposium on ACTES January 1988
Remote Operation Calls (ROC's) are a mechanism for remote execution in a network of personal computers. This paper describes the implementation of a version of ROC's that function in a heterogeneous environment consisting of a network of personal computers and SUN/UNIX machines.

13 Session: Requirements for high performance group support in distributed systems 80%
Werner Vogels , Paulo Veríssimo , Luís Rodrigues
Proceedings of the 5th workshop on ACM SIGOPS European workshop: Models and paradigms for distributed systems structuring September 1992
Although the use of groups and group communication is becoming more and more accepted as an important tool for implementing distributed applications and algorithms, there is still much controversy about the way the group paradigm should actually be implemented. In this paper the authors identify some of the areas in which these controversies still exist and express their views on the matters causing the disagreements.

14 Current work on authentication 80%
Andrew D. Birrell , Butler W. Lampson , Roger M. Needham , Michael D. Schroeder
Proceedings of the workshop on Making distributed systems work September 1986

15 Performing remote operations efficiently on a local computer network 80%
Alfred Z. Spector
Communications of the ACM April 1982
Volume 25 Issue 4
A communication model is described that can serve as a basis for a highly efficient communication subsystem for local networks. The model contains a taxonomy of communication instructions that can be implemented efficiently and can be a good basis for interprocessor communication. These communication instructions, called remote references, cause an operation to be performed by a remote process and, optionally, cause a value to be returned. This paper also presents implementation considerati ...

16 Manageability, availability and performance in Porcupine: a highly scalable, cluster-based mail service 80%
Yasushi Saito , Brian N. Bershad , Henry M. Levy
ACM SIGOPS Operating Systems Review , Proceedings of the seventeenth ACM symposium on Operating systems principles December 1999
Volume 33 Issue 5
This paper describes the motivation, design, and performance of Porcupine, a scalable mail server. The goal of Porcupine is to provide a highly available and scalable electronic mail service using a large cluster of commodity PCs. We designed Porcupine to be easy to manage by emphasizing dynamic load balancing, automatic configuration, and graceful degradation in the presence of failures. Key to the system's manageability, availability, and performance is that sessions, data, and underlying serv ...

17 Replicated distributed programs 80%
Eric C. Cooper
ACM SIGOPS Operating Systems Review , Proceedings of the tenth ACM symposium on Operating systems principles December 1985
Volume 19 Issue 5

18 Remote operations across a network of small computers 80%
Brent Nordin , Ian A. Macleod , T. Patrick Martin
Proceedings of the 1986 ACM SIGSMALL/PC symposium on Small systems December 1986
This paper discusses the design of a Remote Operation Call (ROC) mechanism. ROCs are a generalisation of the remote procedure call concept. They provide for a wider variety of remote calls, such as asynchronous, directed and multicast calls. An implementation of ROCs on a network of personal computers is also described.

19 A simulation based analysis of naming schemes for distributed systems 80%
Taieb B. Znati , Judith Molka
Proceedings of the 25th annual symposium on Simulation April 1992

20 Frangipani: a scalable distributed file system 80%
Chandramohan A. Thekkath , Timothy Mann , Edward K. Lee
ACM SIGOPS Operating Systems Review , Proceedings of the sixteenth ACM symposium on Operating systems principles October 1997
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21 File placement and process assignment due to resource sharing in a distributed system 80%
Anna Ha?
Proceedings of the 17th conference on Winter simulation December 1985
This paper presents a number of solutions to the problems of data access, concurrency control, transaction serialization, and deadlock control based on the examples of existing file systems. Also, policies for file placement and process assignment are discussed from the viewpoint of their impact on system performance and reliability. The impact of these policies depends on the solutions to the problems referred above. A simulation model of a file system is introduced. This model is validate ...

22 Petal: distributed virtual disks 80%
Edward K. Lee , Chandramohan A. Thekkath
Proceedings of the seventh international conference on Architectural support for programming languages and operating systems September 1996
Volume 31 , 30 Issue 9 , 5
The ideal storage system is globally accessible, always available, provides unlimited performance and capacity for a large number of clients, and requires no management. This paper describes the design, implementation, and performance of Petal, a system that attempts to approximate this ideal in practice through a novel combination of features. Petal consists of a collection of network-connected servers that cooperatively manage a pool of physical disks. To a Petal client, this collection appear ...

23 Separating data and control transfer in distributed operating systems 80%
Chandramohan A. Thekkath , Henry M. Levy , Edward D. Lazowska
Proceedings of the sixth international conference on Architectural support for programming languages and operating systems November 1994

Volume 29 , 28 Issue 11 , 5
Advances in processor architecture and technology have resulted in workstations in the 100+ MIPS range. As well, newer local-area networks such as ATM promise a ten- to hundred-fold increase in throughput, much reduced latency, greater scalability, and greatly increased reliability, when compared to current LANs such as Ethernet.We believe that these new network and processor technologies will permit tighter coupling of distributed systems at the hardware level, and that distribu ...

24 Implementing network protocols at user level 80%
Chandramohan A. Thekkath , Thu D. Nguyen , Evelyn Moy , Edward D. Lazowska
IEEE/ACM Transactions on Networking (TON) October 1993
Volume 1 Issue 5

25 Network objects 80%
Andrew Birrell , Greg Nelson , Susan Owicki , Edward Wobber
ACM SIGOPS Operating Systems Review , Proceedings of the fourteenth ACM symposium on Operating systems principles December 1993
Volume 27 Issue 5

26 Implementing network protocols at user level 80%
Chandramohan A. Thekkath , Thu D. Nguyen , Evelyn Moy , Edward D. Lazowska
ACM SIGCOMM Computer Communication Review , Conference proceedings on Communications architectures, protocols and applications October 1993
Volume 23 Issue 4

27 Debuggable concurrency extensions for standard ML 80%
Andrew P. Tolmach , Andrew W. Appel
ACM SIGPLAN Notices , Proceedings of the 1991 ACM/ONR workshop on Parallel and distributed debugging December 1991
Volume 26 Issue 12

28 Personal distributed computing: the Alto and Ethernet software 80%
Butler Lampson
Proceedings of the ACM Conference on The history of personal workstations January 1986
The personal distributed computing system based on the Alto and the Ethernet was a major effort to make computers help people to think and communicate. The paper describes the complex and diverse collection of software that was built to pursue this goal, ranging from operating systems, programming environments, and communications software to printing and file servers, user interfaces, and applications such as editors, illustrators, and mail systems.

29 StratOSphere: mobile processing of distributed objects in Java 77%
Daniel Wu , Divyakant Agrawal , Amr El Abbadi
Proceedings of the 4th annual ACM/IEEE international conference on Mobile computing and networking October 1998

30 Building reliable mobile-aware applications using the Rover toolkit 77%
Anthony D. Joseph , M. Frans Kaashoek
Proceedings of the 2nd annual international conference on Mobile computing and networking November 1996

31 Efficient use of workstations for passive monitoring of local area networks 77%
J. Mogul
ACM SIGCOMM Computer Communication Review , Proceedings of the ACM symposium on Communications architectures & protocols August 1990
Volume 20 Issue 4
Effective management of a local area network (LAN) requires not only a protocol to manage the active entities, but also a means to monitor the LAN channel. This is especially true in shared-channel LANs, such as Ethernet, where the behavior of the LAN as a whole may be impractical to deduce from the states of the individual hosts. Passive monitoring can be done using either a dedicated system or a general-purpose system. Dedicated monitors have been favored for several reasons, but recent w ...

32 Multiplexing issues in communication system design 77%
C. C. Feldmeier
ACM SIGCOMM Computer Communication Review , Proceedings of the ACM symposium on Communications architectures & protocols August 1990
Volume 20 Issue 4
This paper considers some of the multiplexing issues in communication system design by examining overall system issues. In particular, we distinguish physical multiplexing of resources from logical multiplexing of streams. Both physical-resource multiplexing and logical multiplexing determine the service that can be provided by a communication system. We also discuss two issues affected by logical multiplexing - flow control and the relationship between control and data streams of a connect ...

33 A multi-formalism specification environment 77%
Edward A. Ipser , David S. Wile , Dean Jacobs
ACM SIGSOFT Software Engineering Notes , Proceedings of the fourth ACM SIGSOFT symposium on Software development environments October 1990
Volume 15 Issue 6
This paper describes initial work on a software development environment capable of smoothly integrating modules written in different languages. The focus of this work is on supporting the construction of executable, multi-formalism specifications, where each part of a problem is described in a language that is close to its underlying domain. We distinguish specifications from programs to emphasize the closeness of the formalism to these domains rather than underlying comput ...

34 Preliminary thoughts on problem-oriented shared memory: a decentralized approach to distributed systems 77%
David R. Cheriton
ACM SIGOPS Operating Systems Review October 1985
Volume 19 Issue 4
Much of the work to date on distributed systems has focused on the correct choice of *communication paradigm*, stressing (for example) message primitives, remote procedure call,

problem- oriented protocols and so on. A distributed system service is then implemented as a module executing on particular server machine that is accessed using these communication facilities. In contrast, the shared *memory paradigm* has been used on multiprocessor and uniprocessor systems. In the shared memo ...

35 Towards a machine-independent transput section 77%
J. C. van Vliet
Proceedings of the Strathclyde ALGOL 68 conference March 1977
If the transput section of an ALGOL-68 compiler is to be portable, it must be described in such a way that it is clear which aspects are machine-dependent, and which are not. There should be a clear set of primitives underlying the transput. In this report, a description is proposed which can really be used as an implementation model: the transput is described in pseudo-ALGOL 68, except for the underlying primitives, whose semantics are given in some kind of formalized English. The state of ...

36 Algol 68 as an implementation language for portable interpreters 77%
Frank G. Pagan
Proceedings of the Strathclyde ALGOL 68 conference March 1977
By making use of its advanced and highly expressive facilities, Algol 68 can be used to implement interpretive language processors with an unusual degree of conceptual clarity and machine independence. The internal representations of source programs in such a processor consist of high-level data structures which are interpreted by means of a set of readable, mutually recursive Algol 68 procedures. The technique is illustrated by applying it to the implementation of a miniature sample langua ...

37 Replicated procedure call 77%
Eric C. Cooper
Proceedings of the third annual ACM symposium on Principles of distributed computing August 1984
A new mechanism for constructing highly available distributed programs is described. It combines remote procedure call with replication of program modules for fault tolerance. The set of replicas of a module is called a troupe. In a program constructed from troupes, what appears to the programmer as a single inter-module procedure call results in a replicated procedure call. A distributed program constructed in this way will continue to function as long as at least one member of ...

38 An asynchronous garbage collector for the Cambridge File Server 77%
N. H. Garnett , R. M. Needham
ACM SIGOPS Operating Systems Review October 1980
Volume 14 Issue 4

39 The Cambridge File Server 77%
Jeremy Dion
ACM SIGOPS Operating Systems Review October 1980
Volume 14 Issue 4

40 A comparison of two network-based file servers 77%

James G. Mitchell , Jeremy Dion
Proceedings of the eighth symposium on Operating systems principles December 1981
This paper compares two working file servers in terms of their design goals, implementation issues, performance, and service experience. One server, the Xerox Distributed File System (XDFS) [10], was built at the Xerox Palo Alto Research Center; the other, the Cambridge File Server (CFS) [2, 3, 4], was built at the Cambridge University Computer Laboratory. Both file servers support concurrent random access to files over a network, and each offers an atomic transaction mechanism c ...

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41 Managed file distribution on the universe network 77%
Christopher S Cooper
ACM SIGCOMM Computer Communication Review , Proceedings of the ACM SIGCOMM symposium on Communications architectures and protocols: tutorials & symposium June 1984
Volume 14 Issue 2
The file distribution system on the Universe Network consists of a distributed set of co-operating agents which provide clients with a reliable bulk file collection, transfer and delivery service. The agent systems incorporate specialised techniques for optimizing use of the satellite channel, as well as making available facilities for broadcast file distribution. The distributed system architecture and protocols are described, with emphasis on the separation of control and data transfer. A ...

42 A tour through cedar 77%
Warren Teitelman
Proceedings of the 7th international conference on Software engineering March 1984

43 Performance modeling of the distributed computing environment 77%
A. Masud Khandker , Jerome A. Rolia , Toby J. Teorey
Proceedings of the 1995 conference of the Centre for Advanced Studies on Collaborative research November 1995
We develop an analytic performance model for client/server communications using Remote Procedure Call (RPC) with no security over the connectionless datagram protocol in the Open Software Foundation's Distributed Computing Environment (OSF/DCE). It combines features from NetMod, a network performance modeling tool, and the Method of Layers which is a software performance modeling tool. The purpose of this paper is to show that it is possible to

develop analytic performance modeling techniques fo ...

44 Local networking and internetworking in the V-system 77%
David R. Cheriton
Proceedings of the eigth Data Communications Symposium October 1983
Local networking can be treated as a subset of internetworking for remote terminal access and file transfer. However, a distributed operating system, such as the V-System uses a local network more as an extended backplane than a fast, minature long-haul network. This paper describes the use of server-based “intelligent gateways” to provide internetworking using standard protocols in conjunction with an efficient light-weight protocol for V IPC on a lo ...

45 Constraints: On context in authorization policy 77%
Patrick McDaniel
Proceedings of the eighth ACM symposium on Access control models and technologies June 2003
Authorization policy infrastructures are evolving with the complex environments that they support. However, the requirements and technologies supporting context are not yet well understood. Often implemented as condition functions or predefined attributes, context is used to more precisely control when and how policy is enforced. This paper considers context requirements and services in authorization policy. The properties and security requirements of context evaluation are classified. A key obs ...

46 Character streams 77%
A. D. Birrell , R. M. Needham
ACM SIGOPS Operating Systems Review July 1978
Volume 12 Issue 3

47 An asynchronous garbage collector for the CAP filing system 77%
A. D. Birrell , R. M. Needham
ACM SIGOPS Operating Systems Review April 1978
Volume 12 Issue 2

48 The Modula–3 type system 77%
L. Cardelli , J. Donahue , M. Jordan , B. Kalsow , G. Nelson
Proceedings of the 16th ACM SIGPLAN-SIGACT symposium on Principles of programming languages January 1989
This paper presents an overview of the programming language Modula-3, and a more detailed description of its type system.

49 Constructing replicated systems using processors with point-to-point communication links 77%
P. D. Ezhilchelvan , S. K. Shrivastava , A. Tully
ACM SIGARCH Computer Architecture News , Proceedings of the 16th annual international symposium on Computer architecture April 1989
Volume 17 Issue 3
Replicated processing with majority voting is a well known method of achieving fault

tolerance. We consider the problem of constructing a distributed system composed of an arbitrarily large number of N-modular redundant (NMR) nodes, where each node itself is composed of N, N = 2m + 1 and m ≥ 1, processing and voting elements. Advanced microprocessors, such as Inmos Transputers, provide fast serial communication links for inter-processor communication, making it possible to construct larg ...

50 Performance of Firefly RPC 77%

M. Schroeder , M. Burrows

ACM SIGOPS Operating Systems Review , Proceedings of the twelfth ACM symposium on Operating systems principles November 1989

Volume 23 Issue 5

In this paper, we report on the performance of the remote procedure call implementation for the Firefly multiprocessor and analyze the implementation to account precisely for all measured latency. From the analysis and measurements, we estimate how much faster RPC could be if certain improvements were made. The elapsed time for an inter-machine call to a remote procedure that accepts no arguments and produces no results is 2.66 milliseconds. The elapsed time for an RPC that has a ...

51 Session 2: secure Web services: Validating a Web service security abstraction by typing 77%

Andrew D. Gordon , Riccardo Pucella

Proceedings of the 2002 ACM workshop on XML security November 2002

An XML web service is, to a first approximation, an RPC service in which requests and responses are encoded in XML as SOAP envelopes, and transported over HTTP. We consider the problem of authenticating requests and responses at the SOAP-level, rather than relying on transport-level security. We propose a security abstraction, inspired by earlier work on secure RPC, in which the methods exported by a web service are annotated with one of three security levels: none, authenticated, or both authen ...

52 Invited talk: modular architectures for distributed and databases systems 77%

A. Z. Spector

Proceedings of the eighth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems March 1989

This paper describes the importance of modularity in systems and lists a number of reasons why systems will become increasingly modular. It describes two strawmen architecture models for systems and distributed databases in order to illustrate the hierarchical decomposition of complex systems. The paper also relates the systems model to the layering achieved in a few systems familiar to the author.

53 Virtual memory for a hypercube multiprocessor 77%

J. M. Francioni , D. A. Poplawski , S. Pahwa

Proceedings of the third conference on Hypercube concurrent computers and applications: Architecture, software, computer systems, and general issues - Volume 1 January 1988

Most hypercube programs are structured so that all nodes contain an identical copy of the node program, as well as a complete copy of the node operating system program. This is a tremendous waste of memory, which ends up limiting the size and complexity of hypercube application programs. One way around this problem is to implement a virtual memory on the hypercube, whereby one copy of the node and operating system program is distributed among

all the nodes of the hypercube and each node per ...

54 Concurrent I/O system for the hypercube multiprocessor 77%

A. Witkowski , K. Chandrakumar , G. Macchio

Proceedings of the third conference on Hypercube concurrent computers and applications - Volume 2 January 1989

This paper describes the Concurrent I/O (CIO) system for the Hypercube Multiprocessor. Our system has three components: Architecture, User Interface, and Programming Paradigm. The architecture of the system is based on clusters. Each cluster has a hypercube topology and contains either computing nodes or I/O nodes. This architecture scales well, provides a convenient naming convention and offers independent connectivity between the I/O nodes. The routing algorithm confines the I/O traffic w ...

55 Evolving RPC for active storage 77%

Muthian Sivathanu , Andrea C. Arpaci-Dusseau , Remzi H. Arpaci-Dusseau

Tenth international conference on architectural support for programming languages and operating systems on Proceedings of the 10th international conference on architectural support for programming languages and operating systems (ASPLOS-X) October 2002 Volume 37 , 36 , 30 Issue 10 , 5 , 5

We introduce Scriptable RPC (SRPC), an RPC-based framework that enables distributed system services to take advantage of active components. Technology trends point to a world where each component in a system (whether disk, network interface, or memory) has substantial computational capabilities; however, traditional methods of building distributed services are not designed to take advantage of these new architectures, mandating wholesale change of the software base to exploit more powerful hardw ...

56 Incommunicado: efficient communication for isolates 77%

Krzysztof Palacz , Jan Vitek , Grzegorz Czajkowski , Laurent Daynas

ACM SIGPLAN Notices , Proceedings of the 17th ACM conference on Object-oriented programming, systems, languages, and applications November 2002 Volume 37 Issue 11

Executing computations in a single instance of safe language virtual machine can improve performance and overall platform scalability. It also poses various challenges. One of them is providing a fast inter-application communication mechanism. In addition to being efficient, such a mechanism should not violate any functional and non-functional properties of its environment, and should also support enforcement of application-specific security policies. This paper explores the design and implement ...

57 Modular verification of concurrent programs 77%

Brent Hailpern , Susan Owicki

Proceedings of the 9th ACM SIGPLAN-SIGACT symposium on Principles of programming languages January 1982

Verifying concurrent systems can be difficult because of the complex interactions possible between system components. In this paper, we propose a technique to simplify the task: modular composition of sequential proofs. We model a parallel program as a set of modules that interact by procedure calls. The properties of each module are proved using a sequential-program verification technique. If the modules satisfy a set of constraints presented in this paper, we may compose the modules into a sys ...

58 Gathering at the well: creating communities for grid I/O 77%

Douglas Thain , John Bent , Andrea Arpaci-Dusseau , Remzi Arpaci-Dusseau , Miron Livny

Proceedings of the 2001 ACM/IEEE conference on Supercomputing (CDROM) November 2001

Grid applications have demanding I/O needs. Schedulers must bring jobs and data in close proximity in order to satisfy throughput, scalability, and policy requirements. Most systems accomplish this by making either jobs or data mobile. We propose a system that allows jobs and data to meet by binding execution and storage sites together into *I/O communities* which then participate in the wide-area system. The relationships between participants in a community may be expressed by the ClassAd ...

59 Supporting Ada in a distributed environment 77%

A. D. Hutcheon , A. J. Wellings

ACM SIGAda Ada Letters , Proceedings of the second international workshop on Real-time Ada issues June 1988

Volume VIII Issue 7

This paper describes a set of tools which support a pre-partitioning approach to programming distributed systems in Ada. It also considers how these tools can be modified to support fault-tolerant applications.

60 Session 3: Minimal replication cost for availability 77%

Haifeng Yu , Amin Vahdat

Proceedings of the twenty-first annual symposium on Principles of distributed computing July 2002

Today, the utility of many replicated Internet services is limited by availability rather than raw performance. To better understand the effects of replica placement on availability, we propose the problem of *minimal replication cost for availability*. Let replication cost be the cost associated with replica deployment, dynamic replica creation and teardown at n candidate locations. Given client access patterns, replica failure patterns, network partition patterns, a required consis ...

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1 EDA and the network 77%
Mark D. Spiller , A. Richard Newton
Proceedings of the 1997 IEEE/ACM international conference on Computer-aided design
November 1997

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EDA and the network

Authors
Mark D. Spiller
A. Richard Newton

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↑ ABSTRACT

Digital computer networks are playing an increasingly important role in the evaluation, distribution, integration and management of EDA systems. Tools, libraries, design data, and a variety of both design and manufacturing services are accessible today via networks. Networks are also playing a central role in the integration of system design teams, teams that involve a variety of both business and technical disciplines as well as widely distributed geographical locations. Throughout the history of EDA, the architectures used to integrate and distribute computation and interaction have played a central role in the overall design methodology and so have had a major, indirect impact on the choice of the most effective tools, algorithms, and data structures. In this paper, a number of the factors involved in the

choice of a suitable architecture for EDA integration are reviewed and a number of ongoing developments and challenges are presented.

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Note: OCR errors may be found in this Reference List extracted from the full text article. ACM has opted to expose the complete List rather than only correct and linked references.

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Primary Classification:
J. Computer Applications

Additional Classification:
B. Hardware
↳ **B.7** INTEGRATED CIRCUITS
↳ **B.7.1** Types and Design Styles
↳ **Subjects:** VLSI (very large scale integration)

General Terms:
Design, Performance, Theory

Keywords:
EDA, EDA integration, EDA systems, architecture, computer networks, developments, system design teams

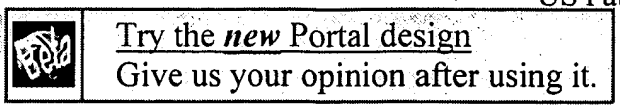
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Thursday, September 25, 2003

These resources and services provide examiners with access to critical prior art. Most of the electronic resources listed on these Web pages are accessed via the Internet. You must be authenticated for data to be accessed. Firewall Authentication.

■ indicates tools featured in TC's NPL training.

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Information Resources by Class and Subclass

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(Training and password required.)
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EEDD Submission Form
Examiners' Electronic Digest Database (EEDD)
(Database of examiner submitted NPL)
EPOQUE
(EPO's databases, available on stand-alone terminal in CPK2, 4B40)

IEEE Xplore
(Full page images of over 800,000 Electrical & Electronic Engineering articles, papers and standards, 1988 - present. Select content is available from 1952-1987.)

INSPEC
(Seven million well-indexed physics, EE, and IT abstracts, 1969-present)

Proquest Direct
(Multidisciplinary subject coverage)

Research Disclosure
(Published monthly as a paper journal and now as an online database product with advanced full text searching capabilities for defensive disclosure information.)

Software Patent Institute (SPI)
(Select "Free Access")

STN on the Web
(Training and password required. The other link is via the Patent Examiner's Toolkit. On your computer, click on the START button, then on the PE Toolkit, then on STN Express.)

True Query
(A resurrected version of the old "Computer Select" database, providing full text access to over 100 technology focused publications, a glossary of technical terms, product reviews and over 60,000 product specifications from 1999 to the present. If html code appears on your screen, click browser's "Reload" or "Refresh" button.)

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Daily Newspapers

Fulltext newspaper articles are available electronically in Proquest Direct.

CD-ROM Resources

Older full text NPL resources/articles received in CD-Rom format. These resources are available on EIC2100 PCs in CPK2, 4B40.

Equipment

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Bartleby.com
(Several versions of Roget's Thesaurus, a dictionary, an encyclopedia, quotations, English usage books and more.)
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Internet Engineering Task Force
(The IETF Secretariat, run by The Corporation for National Research Initiatives with funding from the US govemment, maintains an index of Intemet-Drafts)

Nanotechnology
PCWebopedia
Requests for Comments (RFCs) Database

- Usenet Archive (Google Groups)
- Wayback Machine
(Archived web pages.)

Submit comments and suggestions to Anne Hendrickson To report technical problems, click here

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- Defensive Disclosure Resources
- Legal Resources
- Nanotechnology

- 2004 Renew Lists *New*

General Services

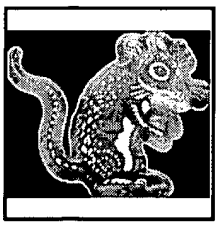
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Glossary

A description of some of the terms and acronyms used

Bayesian

Bayesian *inference* - **Bayesian** inference is a branch of statistical inference that permits the use of prior knowledge in assessing the probability of model parameters in the presence of new data. **Bayesian** inference has been termed 'subjective' inference because it allows a certain subjectivity in the selection of the prior distribution. The prior distribution can strongly affect the posterior (the results). We regard **Bayesian** inference as a useful tool for exploratory analysis of data and as a way to rigourously compare different sets of assumptions. However use of priors necessarily implies a greater responsibility of the researcher to assure that they are not introducing *unintentional* biases into their results through their priors. For this reason it is very important to test the sensitivity of your conclusions to different prior distributions.

Coalescent

The coalescent - a prior distribution on tree shape that links the divergence times of a genealogy (tree of individuals from the same population) with the demographic history of the population.

ESS

Effective Sample Size - The number of effectively independent draws from the posterior distribution that the Markov chain is equivalent to.

HPD

Highest Posterior Density - The x% highest posterior density interval is the shortest interval in parameter space that contains x% of the posterior probability.

Likelihood

the Likelihood - the likelihood Pr{D|Parameters, Tree} is the probability of the observed sequence data given the model of evolution (i.e. the tree, the transition/transversion ratio, gamma shape parameter, proportion of invariable sites, mutation rate et cetera).

MCMC

Markov chain Monte Carlo - Markov chain Monte Carlo is a stochastic algorithm for drawing samples from a posterior distribution, so as to get an estimate of the distribution.

Mixing

Mixing - In MCMC parlance, mixing refers to efficiency with which the MCMC algorithm samples a parameter, or set of a parameters. If an MCMC chain is mixing well, it implies that autocorrelation in the chain is low, ESS is high and the estimates obtained

are accurate. A chain that is mixing well will have parameter traces that look like straight hairy catepillars, with the chain fluctuating so rapidly around the equilibrium that their are no obvious trends. Tutorial 2 has a picture of a trace that shows (after burnin) this hairy catepillar expectation.

Molecular Clock

Molecular clock hypothesis - The molecular clock is a hypothesis that mutation rates and substitution rates do not vary among lineages in a tree. Therefore, if all the lineages of a tree are from the same time they should all have the same genetic distance from the root. An extension of the molecular clock concept to sequences from different times implies that the distance of a particular sequence from the root of the tree should be proportional to the amount of time that has accumulated from the root to the sampling time of that sequence. Thus a plot of root-to-tip distances against sampling times should yield a positive linear correlation with a slope equal to the mutation rate. The molecular clock hypothesis is a fundamental assumption of all models in BEAST.

Operator

Operator - In MCMC parlance, an operator is a method of proposing a new state in the MCMC chain. Operators act by perturbing the current state. The current state includes the tree topology, node heights, subtitution parameters and population parameters. Most operators change only one of these components when they propose a new state. Thus adjacent states of the Markov chain are highly correlated as they share many aspects of their state.

Posterior

The ***posterior probability distribution*** - The posterior (or posterior probability density) is the entity that an MCMC analysis attempts to obtain an estimate of. The posterior is the probability distribution over the parameter state space, *given the data* under the chosen model of evolution. The posterior P(Parameters, Tree|Data) is the (normalized) product of the likelihood, Pr{Data|Parameters, Tree}, and the prior P(Parameters, Tree).

Prior

The prior probability distribution - The prior is the probability distribution over the parameter space, prior to seeing the data. The prior represents your prior belief or prior assumptions about the probabilities of different parameter values before you have analyzed the data. The prior is combined with the likelihood to yield the posterior. In most applications of BEAST the prior is either uniform or a coalescent prior on the tree shape.

Sampling

Sampling - sampling is the main function of an MCMC run. An MCMC analysis generates a series of samples from the posterior distribution. These samples are correlated because each sample is generated by a small perturbation of the previous sample. The ESS of the MCMC chain is an estimate of the number of independent samples that an MCMC represents.

Tip-Date

TipDate - A program that can obtain Maximum Likelihood (ML) estimates of mutation rate from a set of non-contemporaneous sequences assuming a molecular clock and a known tree topology. BEAST offers a very similar method of analysis, but with the added benefits of relaxing the need for a known tree topology and providing the ability to incorporate priors.

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